is, for instance, a discussion on correlated variation which includes this :

> . . . long experimental selection for a given character is commonly found to have produced changes in other characters. . . . MacArthur (1949) selected for large and small size in mice and found that changes in coat color, proportions, litter size, and temperament had also occurred. He interpreted these changes, as far as they were consistent trends, as involving allometry, pleiotropy, and linkage, all three, with drift or sampling effects also producing some nontrend differences between the stocks.

Those who wish to guide human evolution must, it is clear, be fully conscious of the full range of the problems involved, before they are justified in putting forward a programme. Provided that they possess a good foundation of biological knowledge, Dr. Simpson's book will greatly help them to such awareness. S. A. BARNETT.

BLOOD GROUPS

Mourant, A. E. *The Distribution of the Human Blood Groups.* Oxford, 1954. Blackwell. Pp. xxi + 438. Price 42s.

AT the beginning of this century the discovery was made that men could be divided into four groups depending on the presence or absence of the blood group substances A and B on the surface of their red cells. People belonged either to blood groups A, B, AB or to neither of the three : O. All men carry in their plasma agglutinins against AB groups other than their own. O individuals have the anti-A and anti-B; AB individuals carry none; A people carry anti-B, and B people, anti-A. These natural agglutinins can be used to determine to which blood group any one individual's red cells belong. Another blood group system was discovered when human red cells were injected into rabbits and new agglutinins were observed which were not related to the ABO system. Thus in addition to and independently of their ABO groups men could be divided into those with blood group M, N or MN. Animal experiments, or repeated transfusions of human blood in surgical and medical emergencies and leakage into the maternal circulation of the blood of an embryo differing in its blood group from its mother, have all contributed to the discovery of new not usually occurring agglutinins. The most widely known of these is the Rhesus factor which has become so important in the recognition of the hæmolytic disease of the new born, where antibodies formed by a Rhesus negative mother act on the cells of a Rhesus positive infant. These agglutinins can now be utilized to determine the presence of nine blood group systems, and—what is particularly important from the genetical point of view—the genes responsible for at least eight of these are situated on different chromosomes. The discovery that blood groups are inherited by means of simple genes was first made during research in the ABO system ; since then, with one exception, every newly discovered blood group was found to obey the same laws of inheritance. This has, of course, been of great importance in human genetics and a very complete account of present-day knowledge has been presented by Race and Sanger in their *Blood Groups in Man,* first published four years ago and now in its second edition.*

At the end of the first world war another important observation was made among the cosmopolitan medley of soldiers and refugees in Salonika. ABO blood groups were found to be distributed at different frequencies in different populations. Indians had the highest incidence of B and the further east a European people lived the higher was its B frequency. This observation was the starting point of a great volume of work amounting to many thousands of investigations. The frequency of blood groups is to-day as important in the definition of peoples as were all the morphological characters used by anthropologists in the past. Most of the early results have been collected in a book by the American serologist W. C. Boyd which was published in 1939. No really exhaustive survey has appeared since and, of course, in 1939 Boyd could only deal with the ABO and the MN systems. None of the other

* Reviewed on page 259.

groups (except P) were known at that time ; the Rhesus groups which are of such importance in anthropology were discovered in 1940. It seemed impossible that a book could be written on the anthropological aspects of blood group distribution which would be comparable in its completeness to that by Race and Sanger on blood group genetics. One assumed that one had to be satisfied with such books (each excellent in its own way) as Wiener's *Blood Groups and Transfusion* (1943), Boyd's *Genetics and the Races of Man* (1950) or Kherumian's *Génétique et Anthropologie des Groups Sanguins* (1950). We all owe a great debt to Dr. Mourant for having produced the volume under review, which not only catches up on the neglect of the past by combining in one book a full account of to-day's knowledge with a complete bibliography of some 1,700 references—each with full title and first and last page numbers—but which also critically surveys and summarizes the fare it presents. Dr. Mourant is not only an expert in the field of blood groups, as might be expected from the Director of the Medical Research Council's Blood Group Reference Laboratory —and indeed a number of groups have been discovered by him—he is also a geneticist who has made lasting contributions to our understanding of their inheritance, and he has been involved over the last ten years in nearly all major advances in the anthropological field where blood groups were concerned.

The book can be divided into two parts. The first is for the general reader and begins with a survey of the genetics and the anthropological significance of the different blood group systems. There follow chapters dealing with geographical distribution in Northern and Central Europe, the Mediterranean area, Africa south of the Sahara Desert, Asia, Indonesia and Australasia and America (excluding the recent old world immigrants). The general considerations extend beyond pure blood groups to similarly simple genetical systems such as the sickle cell trait and the ability to taste phenylthiocarbamide. The geographical surveys are followed by discussions of migrant and hybrid populations, the blood groups of mummies and bones (" blood group archæology ") and even the blood groups of animals. For the readers of this journal the most interesting chapter might prove to be one called " An Attempt at a Synthesis " which, significantly, is headed by the quotation :

> Strange prodigy is man. Of so short stay,
> Yet linked with Vega and with Niniveh.
> Time-space : what matters it how far away,
> In this strange hall of mirrors through which we stray ?
>
> (WALTER DE LA MARE).

The origin and evolution of human blood groups are discussed and their relation to fitness and disease. For many years certain geneticists have held that, like all human characters, blood groups must be subject to natural selection, but it is only very recently that it has been found that certain common diseases are more frequent in persons of one blood group than of another. Among the diseases of the stomach it seems that cancer is associated more often than expected with blood group A, and peptic ulcer with blood group O.

The second part of the book is largely addressed to the specialist. There are technical chapters on blood grouping and on the calculation of gene frequencies, the imposing bibliography already mentioned, maps of blood group distribution (which however will be equally interesting to the non-expert) and twenty-six blood group frequency tables as well as an exhaustive table, extending over ten pages, of the frequencies of the sickle cell trait. This scholarly volume ends with three indices, topographical and zoological indices to the bibliography, and a very complete and accurate index to the text.

In a future edition one would like to see the maps (which are such a new departure in the representation of blood group distribution) attached to fly-outs so that they can be studied with the relevant text. It is also difficult to unfold some of the tables without tearing them. There are some minor misprints and errors. It might be worth remembering that the Ainu live in Japan and therefore not on the Asiatic mainland (p. 120), the reference to sickling in pygmies

(p. 93) should be 92 and 1542 not 1952, and there are a few verbal slips over terminology. All this can be attended to in the next edition. May one also expresss the hope that by that time the author will be prepared to accept with less reserve the anthropological value of the sickle cell trait? Though it is irritating that the maps, which are such an original and fascinating feature of the book, are so inaccessibly bound, one can state that here is a work which is a credit both to its author, and—not least in view of its price—to its publisher.

H. LEHMANN.

SOCIOLOGY

Ling, Thomas M. (Editor). *Mental Health and Human Relations in Industry.* London, 1954. H. K. Lewis. Pp. xix + 265. Price 21s.

THE Industrial Revolution brought with it new problems for contemporary medicine to solve—problems which perforce were left in abeyance until public opinion could be orientated toward the socio-medical aspects of man, the industrial pawn. The seeds of industrial psychology, however, were sown on ground which had already been well prepared by the early pioneers of social medicine, and under the impetus of two major wars industrial mental hygiene has developed into a very necessary and mature offspring of psychology and sociology, nurtured under the benevolent blessing of the Welfare State. This " new look " in industry is important not only to occupational man himself, but also to the efficiency of the working unit, whether it be a one-man business or a large factory group, and the big business barons now look with kindlier eye upon the adaptation of psychological techniques to industrial problems, for efficiency can be quantified in terms of monetary units.

Although this child of the two disciplines, sibling of psychiatry, may be deemed to have passed the trials and turmoils of adolescence in this country, elsewhere she is proving somewhat precocious; in Europe especially, application precedes the necessary consolidation of theory, and many of the tests and techniques in this rapidly expanding branch of applied psychology are to some extent premature, and lack the continuity of experience which features so prominently in the British background.

For this reason, and in view of the similarity among the basic problems of human relations in different countries, there is a pressing need for a more comprehensive and integrated channel of international communication. Under the inspired leadership of their Medical Director, the resident and visiting staff of Roffey Park Institute have co-operated in the production of a text-book designed to satisfy this need, and destined to achieve pre-eminence among the literature in this field.

Written authoritatively at university level by men of high standing in their respective professions, this book is more than an academic treatise, combining as it does the best features of a text-book and a practical handbook or manual. These men are not simply theoreticians; in the clouds of future progress their heads may well be, but their feet are firmly planted on the floors of wards and workshops, where every hypothesis must stand trial at the bar of experience. Of the latter commodity there has been no shortage, for more than eight thousand patients have been treated at Roffey Park Industrial Rehabilitation Unit in the last decade, and much valuable knowledge has been gained in rehabilitating the sick and rounding off the square pegs. Here, under controlled experimental conditions, the tensions and drives which underlie all workshops relations can be carefully observed in exaggerated form, magnified by the heightened emotionality of the subjects. The ill-health of many of the individuals has been found to stem from their maladjustments to work, and reorientating these cases to a different environmental setting has provided new and important perspectives in industrial mental health.

In the first two chapters the wider implications of mental health and human